

HEALTH AND SOCIAL CARE

This briefing summarises how health and social care have been assessed in the latest UK Climate Change Risk Assessment (CCRA) Technical Report, and what types of action to adapt to climate change risks and opportunities would be beneficial in the next five years.

The full assessment looks at risks and opportunities for the UK under two climate change scenarios, corresponding to approximately a 2°C or a 4°C rise in global temperature by 2100. It answers three questions, for 61 different risks or opportunities using available published evidence and analysis:

- 1. What is the current and future level of risk or opportunity?**
- 2. Is the risk or opportunity being managed, taking account of government action and other adaptation?**
- 3. Are there benefits of further adaptation action in the next five years, over and above what is already planned?**

The main findings from the full assessment related to health and social care are summarised below, together with the adaptation actions that would be beneficial over the next five years. Each risk or opportunity has an identifier code linked to the full analysis, which is available in the CCRA3 Technical Report.

Readers are encouraged to use these briefings to locate the parts of the Technical Report of most relevance to them.

Alternatively, if you would like a summary of the analysis by UK nation, please go to the national summary documents:

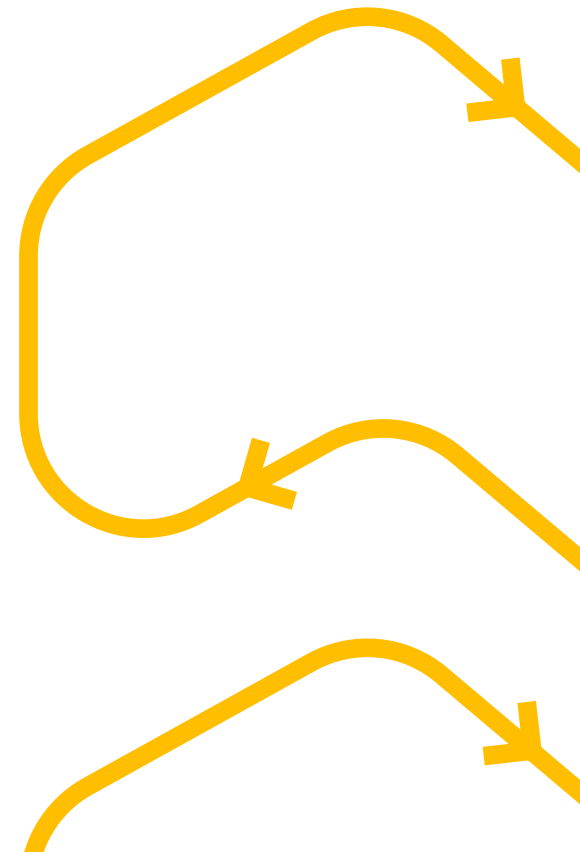
- **England • Northern Ireland**
- **Scotland • Wales**

This briefing is aimed primarily at the UK Government, the governments of Scotland and Wales, the Northern Ireland Assembly and their respective departments and agencies responsible for health and social care. However, it should also be of interest to a wider audience.

Note: The COVID-19 pandemic may have long term implications for the resilience of the health and social care sector.

The pandemic has caused an additional stress on the health and social care system due to increased demand (likely to last until 2022) and additional pressures on local finances (likely to last longer term).

More positively, the impacts of COVID-19 may have raised awareness of the importance of understanding major threats that can disrupt lives and livelihoods, including low probability, high impact flood events.



Key messages



- The health and social care systems across the UK are made up of people, buildings, infrastructure networks, equipment and service provision, with numerous providers. All these components are exposed to the climate hazards that will worsen as the climate changes including flooding, overheating, and water scarcity. There could also be increasing risks from high winds or storms, and changes in air quality.
- High temperatures lead to both increases in heat-related deaths and illness, and emergency service disruption from longer response times. Vulnerable people being exposed to high temperatures in hospitals, care homes and when receiving home-based care is of particular concern as temperatures across the UK will continue to rise and heatwaves become more common. Warmer winters should reduce burdens on the NHS in winter from cold-related deaths to some extent, though they are projected to remain high even with climate change, and preparations for cold weather will remain important.
- The CCRA flood projections show that health and social care assets including hospitals, GP surgeries, care homes and emergency services stations will become increasingly exposed to flooding without additional adaptation measures.
- The health and social care system in the UK could also be put under greater pressure from increases in health-related impacts from vector-borne diseases, poor air quality, and poor water quality or water supply interruptions as the climate changes.
- Health inequalities mean that the health risks from climate change are not evenly distributed. Adaptation planning needs to consider who benefits and who is potentially disadvantaged by specific measures.
- There could be benefits of further investment in research as well as strategies to increase physical activity and improve mental health from greater outdoor recreation and active travel (e.g. walking and cycling) due to warmer temperatures.

Risks, opportunities, and benefits of further action



More action needed

Further investigation

Sustain current action

Maintain a watching brief

Average UK wide scores

H1. Risks to health and wellbeing from high temperatures

H2. Opportunities for health and wellbeing from higher temperatures

H3. Risks to people, communities, and buildings from flooding

H12. Risks to health and social care delivery from extreme weather

H13. Risks to prison and education services from extreme weather

H7. Risks to health and wellbeing from changes to indoor and outdoor air quality

H8. Risks to health from vector borne diseases

ID9. Risk to UK public health from climate change overseas

H10. Risks to health from poor water quality or supply interruptions

1. Risks to health and social care delivery from extreme weather (H12)



As well as affecting health burdens on the health and social care system, climate change will disrupt assets and services directly, through the effects of floods, heatwaves and other extreme weather on hospitals and other health and care settings, as well as the buildings and infrastructure on which they rely.

For example, it has been estimated that up to 90% of hospital wards could be at risk from overheating due to their design, while 10% of UK hospitals are located in areas of significant flood risk.

Flooding projections developed to support the analysis for this CCRA Technical Report give estimates of future flood risk for hospitals, care homes, emergency services and GP surgeries under a range of different scenarios.

Since the previous national risk assessment was published in 2017 (CCRA2) there are also further examples of impacts on patients, staff, health infrastructure and equipment within the health and social care system from extreme weather.

The magnitude of current risk is medium, rising to high by the 2050s for England and Wales.

Beneficial actions in the next five years include:

- **Regional/local level climate risk assessments by Trusts, Health Boards and local government social services (where these are not already happening) to help them plan forward with climate risks in mind.**
- **Ensure that designs for new care homes, hospitals and other health and social care assets are considering future temperatures as well as flood risk.**
- **Undertake further economic analysis of adaptation options for care homes.**
- **Use adaptive measures such as improved glazing, draught proofing, shutters, reflective surfaces, green cover and green space and ceiling fans, where appropriate.**
- **Monitoring of indoor temperatures and other indicators to respond to changes over time.**

Further details on this risk: Health, Communities and Built Environment Technical Chapter, risk H12



2. Risks to health and wellbeing from high temperatures (H1)



High temperatures will lead to increased numbers of people becoming ill or dying across the UK.

During the summer of 2020 for example, an additional ~2,500 deaths were recorded during the heatwave across England, which could not be explained by other factors.

Many individuals are more susceptible to both COVID-19 and heat stress such as older persons, those with chronic health conditions and persons living in residential care.

UK heat-related deaths could triple by the 2050s, considering the effects of climate change and population growth (high magnitude now and in the future).

While there is more evidence since CCRA2 about the risks of overheating in homes and the effectiveness and limitations of strategies for cooling of buildings, policies to protect people from overheating in new and existing homes are still to be developed fully across the UK.

Beneficial actions in the next five years include:

- The updating of building regulations or other policy measures to address overheating in new and refurbished homes.
- Increased guidance and incentives to address overheating in existing homes to reduce exposure to excessive heat indoors.
- Improved urban planning designs that make use of outdoor cooling measures such as green and blue infrastructure (e.g. trees, parks, ponds and lakes). This can also help to deliver other benefits around air pollution and flood alleviation.
- Better coordination between decarbonisation and adaptation policies and strategies for homes.

Further details on this risk: Health, Communities and Built Environment Technical Chapter, risk H1



3. Opportunities for health and wellbeing from higher temperatures (H2)



Higher temperatures in winter could reduce the number of cold-related deaths and associated burdens on the NHS to some degree, though population aging is likely to offset some of the benefit from warmer winters for cold-related mortality, and a public health response to mitigate the health impacts of cold weather will remain important.

As well as reducing the risks from cold, there could be health benefits from warmer temperatures that would in turn also reduce disease burdens on the health and social care system.

The physical and mental benefits of increased physical activity and contact with nature are well established (including improved Vitamin D uptake), though there remains limited evidence of whether a warmer climate will increase these activities, and this is an area requiring further research to quantify the benefits.

There are also potential risks through increased sun exposure leading to potentially higher levels of skin cancer, so public awareness campaigns will remain important. The current magnitude is low, rising to medium for England and Wales by the end of the century.

Beneficial actions in the next five years include:

- **Further investment in research as well as strategies (e.g. improved infrastructure) to increase physical activity and improve mental health from greater outdoor recreation and active travel (e.g. walking and cycling) due to warmer temperatures.**
- **Despite a projected reduction in risk, it will be important to maintain planning within the health and social care system for cold-weather impacts. The burden from ill-health associated with cold weather and cold homes will remain significant in the future, even with some decline in hazard due to climate change.**
- **Any increased attention on managing the risks from heat should not lead to a subsequent decline in attention to managing the risks from cold. Both heat- and cold-related health impacts will remain and require health and social care service interventions in the future.**

Further details on this opportunity: Health, Communities and Built Environment Technical Chapter, opportunity H2



4. Risks to people, communities and buildings from flooding (H3)



The risk of flooding to people, communities and buildings is one of the most severe climate hazards for the population, both now and in the future.

Approximately 1.9 million people across the UK are currently living in areas at significant risk flooding from either river, coastal or surface water flooding. This number could double as early as the 2050s.

Flooding has profound impacts on the people who experience it. As well as a small number of annual deaths or injuries, there is growing evidence of long-term and severe impacts on mental health and wellbeing from flooding; damage to property including the upheaval and financial implications of cleaning up; disrupted access to employment, education, health services and wider facilities; and illness from water-borne pathogens or chemical contaminants arising from floods.

The magnitude of risk is classified as high now and in future for all four nations of the UK.

Beneficial actions in the next five years include:

- Working across the UK nations and widely sharing outcomes from case study examples and initiatives such as the Flood and Coastal Resilience Innovation programme in England to enable a more integrated approach and more fuller public engagement.
- Increase investment in socially vulnerable areas and introduce new metrics focused on reducing social vulnerability to flooding to help further mitigate the social costs of flooding.
- Understand how new developments built in at-risk areas are being made safe and resilient, for all new properties in high risk locations. This information should be publicly available by development, and should include whether properties are being protected by flood defences and property flood resilience.
- There is a strong argument for greater enforcement on Sustainable Drainage Systems (SuDS) which will help to reduce flood risk but can also provide green space, reduce air pollution, help reduce urban temperatures and help to achieve biodiversity net gain in new developments.

Further details on this risk: Health, Communities and Built Environment Technical Chapter, risk H3



5. Risk to delivery of education and prison services from extreme weather (H13)



The effects of climate hazards on education and prison services are a health concern given the risks to people in those settings from hazards such as flooding or heat.

These sectors, which include schools, universities, nurseries and other early years settings, prisons, courts and secure units, have seen disruption in recent years from flooding and heavy rainfall.

Regarding heat, recent local studies have shown that high temperatures can be one of the key factors in affecting the concentration of children in schools, and high numbers of complaints have been received as a result of overheating in prisons.

The risk to education and prison services specifically was not addressed in the previous climate change risk assessment (CCRA2) and is an emerging area of concern.

The risk is considered medium now, potentially rising to high for England by the 2080s.

Beneficial actions in the next five years include:

- Conduct site risk assessments at educational and prison establishments and produce adaptation plans with specific targets, tasks and roles to ensure delivery and effectiveness.
- Promote use of cooling technologies and ventilation in schools, such as natural ventilation systems, automated window ventilation, hybrid natural and mechanical ventilation, thermal massing and solar shading.
- Maintenance, for example, of roofs, gutters and drains, alongside the installation of retrofit measures such as increasing permeability of surfaces, cool or green roofs, solar shading, sustainable drainage, and cooling and water saving technologies.

Further details on this risk: Health, Communities and Built Environment Technical Chapter, risk H13



6. Risks to health and wellbeing from changes in indoor and outdoor air quality (H7)



Air quality in this assessment includes outdoor air quality from man-made sources such as traffic and industry, indoor air quality associated with housing characteristics and ventilation, and natural sources of pollution related to pollen and mould that affect health.

Outdoor air pollution is associated with tens of thousands of deaths per year in the UK, which pose a significant burden to the NHS. The main health-related hazard from outdoor air pollution is particulates (PM2.5 and PM10). Particulate levels could fall rapidly under net zero carbon scenarios, though research is ongoing about the effects on these pollutants of changing temperatures or wind patterns, or hazards such as wildfire on exposure.

Ground level ozone can also affect health and is the dominant hazard that could increase when considering future climate change impacts on outdoor air quality.

Other air borne allergens like pollen are known to exacerbate respiratory complaints for some people, but their changing levels due to climate change are uncertain.

The climate change risk assessment considers only the incremental change in risk from climate change itself to air quality, rather than the effects of changes in emissions.

The effects of indoor air pollution exposure on people in their homes, schools, and offices is an emerging focus of research.

There is at present a lack of evidence for the impact of climate change itself on indoor air quality, other than on levels of damp and mould.

Beneficial actions in the next five years include:

- Further research on climate change impacts on wildfire and pollen risks, and their effects on health.
- More research on the relationship between air pollutants and extreme heat.
- Consider health co-benefits and harms of potential adaptation actions, e.g., changing ventilation standards and improving green space for air quality.
- Consideration of how interventions to increase airtightness of buildings may worsen indoor air quality.

Further details on this risk: Health, Communities and Built Environment Technical Chapter, risk H7



7. Risks to health from vector-borne diseases (H8 and ID9)



Some diseases transmitted by insects and ticks (vectors) are likely to change in prevalence in the future due to warmer temperatures contributing to a changing the distribution of the vector in the UK (risk H8 – ranging from low to medium magnitude until the 2080s) as well as diseases acquired by people overseas and being brought back into the UK (risk ID9 – high magnitude now and in the future).

There have been changes in observed distributions and seasonal activity of some vectors across Europe since the last risk assessment including ticks (which transmit Lyme Disease), Culex and Aedes species of mosquitos. While the risk of some mosquito-carried diseases could increase in the UK (including Zika virus, West Nile virus, chikungunya, and dengue fever) there is uncertainty around the likelihood of this occurring and it has not been possible to estimate this in the risk assessment. The risk that malaria may become established in the UK remains low.

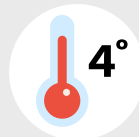
In addition to local transmission, the risk of people contracting diseases abroad and bringing them back into the UK may increase though the size of the changing risk is difficult to estimate at present.

In addition to changing the distribution of vectors, exposure to those vectors such as ticks could increase in overseas visiting populations spend more time outdoors due to warmer weather, though there are large uncertainties about how far climate change will alter levels of outdoor recreation across the UK.

Beneficial actions in the next five years include:

- **Enhanced disease and vector surveillance and monitoring systems across the UK, alongside further research on 'vector competence' (whether the vector is able to carry and transmit the disease).**
- **Further modelling of risk of emergent vector-borne disease due to climate change to anticipate future changes to this risk.**

Further details on these risks: Health, Communities and Built Environment Technical Chapter, risk H8 and the International Dimensions Technical Chapter, risk ID9



8. Risks to food safety and food security from UK climate impacts (H9)



Increases in extreme weather patterns, variations in rainfall and changing annual temperatures will impact the occurrence and persistence of bacteria, viruses, parasites, harmful algae, fungi and their vectors in crops and livestock produced in the UK.

Animal products (meat and eggs) carry a higher risk than vegetables.

In terms of food security, access to healthy and affordable food is a public health issue; food insecurity driven by stock shortages or higher prices is often associated with inadequate intake of fruit, vegetables and some essential micronutrients. Some studies project an average rise in price of 20% by 2050, though with a large uncertainty range.

Due to the large burden of disease associated with food safety and the potential for very significant impacts from near term shortages in access to healthy foods, this risk is currently considered high magnitude now and in the future across the UK.

Beneficial actions in the next five years include:

- **Horizon scanning and continuous monitoring to ensure current regulations are adequate.**
- **Routine monitoring of food security across the UK to protect public health and limit unnecessary costs for the health and social care system.**
- **Predicting future climate risks to the UK food system to ensure groups vulnerable to food insecurity are protected and the impacts to public health are minimised.**
- **As mycotoxins may be an increasing risk the UK food system in the future, some proposed strategies in agriculture and food transport can limit the risk of fungal infections (e.g. optimal harvest timing).**
- **Adopting new farming techniques such as deep ploughing to control ergot, targeting fungicide application, planting crop resistance varieties and introducing bio-control or genetic modification measures can limit the introduction of fungal spores to crops and the subsequent food system, though some of these measures can lead to other consequences, such as increased soil erosion and carbon losses.**

Further details on this risk: Health, Communities and Built Environment Technical Chapter, risk H9

9. Risk to water quality and household water supply (H10)



Reduced summer precipitation resulting from climate change will increase the likelihood of periods of water scarcity which, together with demand increases from economic and population growth, may lead to interruptions of household water supplies. This would have health, social and economic impacts, particularly for vulnerable households.

Parts of the UK, particularly within south-east England are already water stressed.

Climate change may also increase the risk of contamination of drinking water through increased runoff and flooding events that overwhelm current water treatment approaches.

Risks to health from contact with contaminated bathing water (sea, lakes and rivers) and harmful algal blooms are also likely to increase with climate change.

Assessments of the impacts of climate change on future water supply have found that low flows and deficits are more likely by the middle of the century in England and parts of Wales.

Private water supplies are most vulnerable to current and future climate hazards that affect water quality (contamination with pathogens or chemicals) and quantity (interruption of supply) and are particularly important for more isolated communities. Recent hot summers have highlighted that private water supplies are vulnerable to dry and warmer weather and it is likely as the climate continues to change that more private supplies will dry out.

Beneficial actions in the next five years include:

- **Reducing the risk of contamination of water supplies from surface water and sewer flooding through increased implementation of SuDS, catchment management and wetland creation.**
- **Increased consideration in emergency planning so that responses to emergencies (e.g. exposure to chemicals in flood waters, or private water supplies being cut off) can be ramped up quickly as needed.**

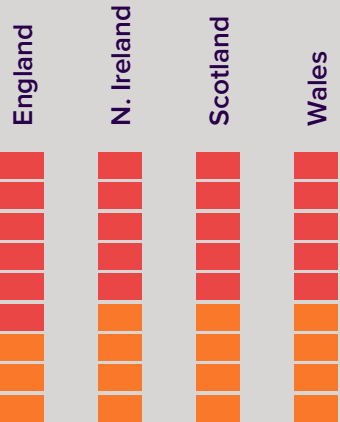
Further details on this risk: Health, Communities and Built Environment Technical Chapter, risk H10



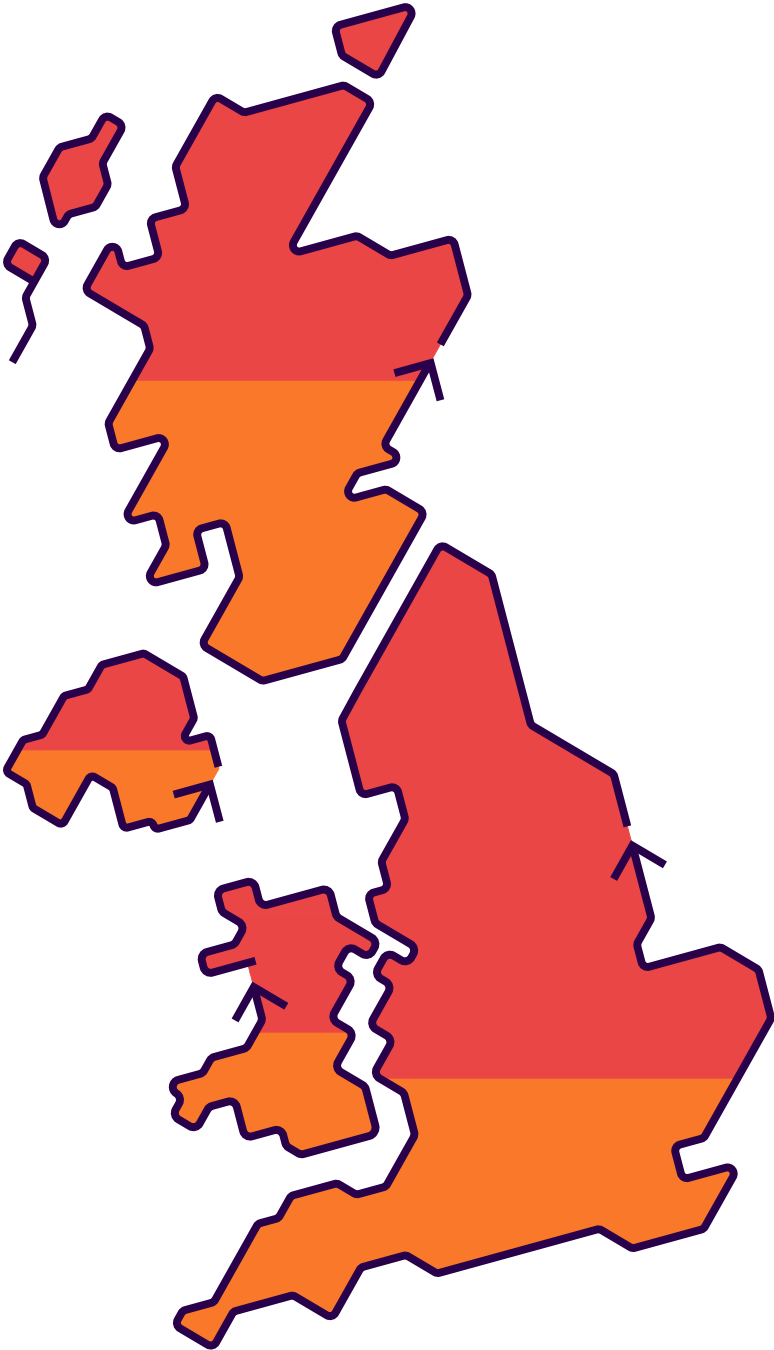
Variations across the UK

Key

- More action needed
- Further investigation
- Sustain current action
- Maintain a watching brief



Risk or opportunity	England	Northern Ireland	Scotland	Wales
Risks to health and wellbeing from high temperatures (H1)	●	●	●	●
Opportunities for health and wellbeing from higher temperatures (H2)	●	●	●	●
Risks to people, communities, and buildings from flooding (H3)	●	●	●	●
Risks to health and social care delivery from extreme weather (H12)	●	●	●	●
Risks to prison and education services from extreme weather (H13)	●	●	●	●
Risks to health and wellbeing from changes to indoor and outdoor air quality (H7)	●	●	●	●
Risks to health from vector borne diseases (H8)	●	●	●	●
Risk to UK public health from climate change overseas (ID9)	●	●	●	●
Risks to health from poor water quality or supply interruptions (H10)	●	●	●	●



Background

The UK Government is required by the UK Climate Change Act 2008 to assess the risks and opportunities from climate change to the UK every five years and respond to the risks via a National Adaptation Programme, covering England. The devolved administrations also publish their own adaptation programmes in response to the risk assessment.

For this third UK Climate Change Risk Assessment, the Government's independent advisers on climate change, the Climate Change Committee (CCC), have been asked to prepare an independent risk assessment setting out the latest evidence on the risks and opportunities to the UK.

Over 450 people from more than 130 organisations have contributed to preparing the assessment. The risks have been assessed using the latest climate projections for the UK which were updated in 2018 by the Met Office. These briefings summarise some of the key topics that are assessed through the Technical Report, to enable readers to understand the key messages and where to find more detail.

Where to find more detail

Each risk or opportunity in this briefing has an identifier code linked to the full analysis, which is available in the CCRA3 Technical Report. Readers are encouraged to use these briefings to locate the parts of the Technical Report of most relevance to them.

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